

WHAT IS CLAIMED IS:

1. A method for making a gypsum product, comprising:
forming a slurry from gypsum, water and an emulsion comprising a wax component comprising a nonsaponifiable wax and a saponified wax, an alkyl phenol component, a dispersant/surfactant, a carboxymethylcellulose component, and water;
and
forming the slurry into a solid product.
2. The method of claim 1 wherein the wax component comprises about 25% to about 50% of the emulsion, by weight.
3. The method of claim 1 wherein the wax component comprises about 30% to about 40% of the emulsion, by weight.
4. The method of claim 1 wherein the nonsaponifiable wax is a slack wax, a scale wax, a paraffin wax or a combination thereof.
5. The method of claim 1 wherein the saponified wax is produced by reaction of a saponifiable wax with ammonium hydroxide, an alkali metal hydroxide or a combination thereof.
6. The method of claim 5 comprising a saponified wax produced by reaction of a saponifiable wax with potassium hydroxide or sodium hydroxide.
7. The method of claim 5 comprising a saponified wax produced by reaction of a saponifiable wax with ammonium hydroxide.
8. The method of claim 1 wherein the alkyl phenol component comprises a C₂₀–C₄₂ alkyl group.

9. The method of claim 1 wherein the alkyl phenol component comprises a C₂₄ – C₃₄ alkyl group.
10. The method of claim 1 wherein the alkyl phenol component comprises a C₂₄ – C₂₈ alkyl group.
11. The method of claim 1 wherein the dispersant/surfactant comprises a polynaphthalenesulfonic salt.
12. The method of claim 1 wherein the alkyl phenol component comprises an alkyl phenol having an alkyl group that has an average carbon chain length that matches the carbon chain length of the carboxymethylcellulose.
13. The method of claim 1, wherein
 - the nonsaponifiable wax comprises about 33% to about 35% of the emulsion, by weight;
 - the saponified wax comprises about 3% to about 5% of the emulsion, by weight;
 - the alkyl phenol component comprises about 0.5% to about 2.5% of the emulsion, by weight;
 - the dispersant/surfactant comprises about 0.5% to about 2% of the emulsion, by weight; and
 - the carboxymethylcellulose component comprises about 0.2% to about 5% of the emulsion, by weight.
14. The method of claim 13 wherein the saponified wax is produced by a reaction of a saponifiable wax with ammonium hydroxide, and further comprising about 0.5% formaldehyde, by weight.
15. The method of claim 1 wherein the gypsum product comprises gypsum board.

16. The method of claim 1 wherein the slurry further comprises about 50 wt. % to about 95 wt. % of a lignocellulosic material based on the combined weight of the lignocellulosic material and gypsum.
17. The method of claim 13 wherein the gypsum product comprises gypsum board.
18. The method of claim 13 wherein the slurry further comprising about 50 wt. % to about 95 wt. % of a lignocellulosic material, by the combined weight of the lignocellulosic material and the gypsum.
19. The method of claim 13 wherein the gypsum product comprises a gypsum wood fiber product.
20. The method of claim 1 wherein the emulsion contains wax in an amount of about 1.5 wt.% to about 3 wt. % by weight of the finished product.
21. The method of claim 13 wherein the emulsion contains wax in an amount of about 1 wt.% to about 3 wt. % by weight of the finished product.
22. A gypsum product made from a slurry made from gypsum, water and an emulsion comprising a wax component comprising a nonsaponifiable wax and a saponified wax, an alkyl phenol component, a dispersant/surfactant, a carboxymethylcellulose component, and water.
23. The gypsum product of claim 22 wherein the alkyl phenol component comprises an alkyl phenol having an alkyl group that has an average carbon chain length that matches the carbon chain length of the carboxymethylcellulose.

24. The gypsum product of claim 23 wherein the nonsaponifiable wax comprises about 33% to about 35% of the emulsion, by weight;
the saponified wax comprises about 3% to about 5% of the emulsion, by weight;
the alkyl phenol component comprises about 0.5% to about 2.5% of the emulsion, by weight;
the dispersant/surfactant comprises about 0.5% to about 2% of the emulsion, by weight; and
the carboxymethylcellulose component comprises about 0.2% to about 5% of the emulsion, by weight.
25. The gypsum product of claim 24 wherein the alkyl phenol component comprises an alkyl phenol having an alkyl group that has an average carbon chain length that matches the carbon chain length of the carboxymethylcellulose.
26. The gypsum product of claim 22 further comprising a preservative.
27. The gypsum product of claim 26 wherein the preservative comprises about 0.0025% to about 0.2% of the product, by weight.
28. The gypsum product of claim 24 wherein the emulsion comprises about 0.1% to about 2% preservative, by weight.
29. A gypsum product comprising gypsum, a wax component comprising a nonsaponifiable wax and a saponified wax, an alkyl phenol component, a dispersant/surfactant, and a carboxymethylcellulose component.
30. The gypsum product of claim 26 comprising a preservative.

31. The gypsum product of claim 26 further comprising about 50 wt. % to about 95 wt. % of a lignocellulosic material, by the combined weight of the lignocellulosic material and the gypsum.
32. The method of claim 1 wherein the slurry comprises a preservative in an amount of about 0.0025 wt. % to about 0.2 wt. % by weight of the product.
33. The method of claim 13 wherein the emulsion comprises about 0.1% to about 2% preservative, by weight.
34. The gypsum product of claim 29 comprising a preservative in an amount of about 0.0025 wt. % to about 0.2 wt. % by weight of the product.